UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,388	04/19/2001	Jae Yoon Lee	1630-0373PUS1	7290

2292 7590 07/28/2008

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
LIN, JAMES	
ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
07/28/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	09/837,388	LEE ET AL.	
	Examiner	Art Unit	
	Jimmy Lin	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9,10,12-14,16,18-25 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9,10,12-14,16,18-25 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/23/2008 has been entered.

Definitions

2. "Letterpress" is defined by Merriam-Webster's Collegiate Dictionary, 10 edn., as "the process of printing from an inked raised surface esp. when the paper is impressed directly on the surface" (in contrast to "intaglio": "printing (as in die stamping and gravure) done from a plate in which the image is sunk below the surface"). "Flexography" is defined as "a process of rotary letterpress printing using flexible plates and fast drying inks".

Claim Objections

3. Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support forming the forming the pixel electroces after forming the barrier ribs (Figs. 9A-9D) in the same embodiment as having an upper portion of the barrier rib overlap an edge of a pixel electrode (Figs. 11A-11D).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 9, 12, 14, 16, 18, 20, 22, 25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pei et al. (U.S. Patent No. 5,682,043) in view of Wright (U.S. Patent No. 3,661,081), Ozawa (U.S. Patent No. 6,194,837), Miyashita et al. (WO 98/24271, references made are to the English equivalent U.S. Publication No. 2001/0001050), and Samworth (U.S. Patent No. 6,213,018). Ireton (U.S. Patent No. 4,611,539) is cited as evidence.

Pei teaches a method of patterning an electroluminescent (EL) display (cols. 1-2). The method comprises flexographic printing a semiconductor polymer ink (col. 10, lines 14-28), which is the light-emitting layer (col. 7, line 13-col. 9, line 28). The polymer may be applied in solution (col. 10, lines 14-17).

Ireton teaches that flexography is understood in the art to mean: providing a flexible printing plate (i.e., a molding plate) adhered to (i.e., disposed on) a plate cylinder or printing roller (i.e., a molding roller), said molding plate having a raised image (i.e., convex and concave portions, with the convex portion (the raise image) defining lands), applying the ink to the raised portion (i.e., each land of the convex portion of the molding plate) and printing the ink from the molding plate onto a substrate by rotating the roller so that the land on each convex portion contacts the substrate.

Pei (and the definition given by Ireton) does not explicitly teach a plurality of convex and concave portions. However, Pei does indicate that different inks may be desired in different locations (col. 7, lines 12-20). Wright illustrates a flexographic process and makes it clear that

there may be a plurality of convex printing portions (5) and concave non-printing portions (6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a flexographic plate with a plurality of convex and concave regions with a reasonable expectation of success because Pei indicates that areas with different properties are desired and because Wright teaches that a method of depositing inks in desired areas is to have a plurality of convex and concave regions.

Pei teaches that different materials may be printed in different locations, for example, to apply different colors (col. 7, lines 12-21), but does not explicitly teach the use of barrier ribs between pixels. However, Ozawa teaches that it is well known in the art of EL devices to use barrier ribs (i.e., banks) between pixels of different colors. A pixel electrode 41 can be formed between the barrier ribs and comes into contact with the upper portion of the barrier ribs (Fig. 6(B)). Ozawa teaches that such configurations were operable but would partially produce a light that does not contribute to the displaying of an image, thus resulting in a useless driving current (col. 11, lines 33-47). One of ordinary skill in the art would have used the structure of Fig. 6(B) with the knowledge that extra driving current would be necessary because Ozawa teaches that such structures were operable. Ozawa also teaches that the barrier ribs can be used to confine the EL material when using an ink-jet technique (col. 3, lines 45-56). Although Ozawa does not mention the use of the barrier ribs in conjunction with flexographic printing methods, one of ordinary skill in the art would have recognized that the barrier ribs could have been used to confine EL material solution in any solution deposition method, such as flexographic printing processes. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used barrier ribs in the printing method of Pei and Wright with a reasonable expectation of success. One would have been motivated to do so in order to have confined the EL materials to in their respective pixels.

Ozawa does not explicitly teach that the pixel electrodes are formed after forming the barrier ribs. However, one of ordinary skill in the art would have expected the formation of either layer first to have achieved similar results and would have used one method over the other with predictable results. The selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See, for instance, *In re Burhans,* 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Therefore, it would have been obvious to one of ordinary skill

in the art at the time of invention to have formed the pixel electrodes prior to forming the barrier ribs with a reasonable expectation of success.

Ozawa teaches that the barrier ribs can be formed of an insulating layer (col. 3, lines 13-17), but does not explicitly teach that the barrier ribs are made from a material selected from the group consisting of polyimide and an acryl-group organic compound. However, Miyashita teaches that it was well known in the EL art to have used a photosensitive polyimide as the particular material for the barrier ribs [0046]. Because Ozawa teaches that the barrier ribs can be made of an insulating material and because Miyashita teaches that polyimide (i.e., an insulating material) was an operable material for forming barrier ribs, it would have been obvious to one of ordinary skill in the art at the time of invention to have used polyimide as the particular material of the barrier ribs of Ozawa with a reasonable expectation of success.

Pei and Wright teach a flexographic plate (i.e., a rolling stamping member), but do not explicitly teach that the convex printing portions protrude in a stripe shape and have a plurality of indentations. However, Samworth teaches that it was well known in the art of flexographic printing to have provided convex lands in a stripe shape and a plurality of indentations on the convex lands (col. 5, lines 1-5; Fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have provided the convex printing portions of Pei and Wright with a stripe shape and to have a plurality of indentations with a reasonable expectation of success because Samworth teaches that such structures of the convex printing portions were operable for flexographic plates. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945).

Claim 12: Ozawa teaches that the barrier ribs define boundaries between pixels (Fig. 6(B)).

Claim 14: Ozawa teaches that the height of the barrier rib can be larger than the combined thickness of the EL material and pixel electrode (Fig. 6(B)).

Claim 16: Miyashita teaches that the barrier rib can be formed from a polyimide material [0046].

Claim 18: Wright teaches that the ink may be supplied to the convex portions of the flexographic roller by rotating it and a supply roller (9) (Fig. 1, col. 3, lines 41-49).

Claim 22: Pei teaches that the layer may be 500 angstroms thick (col. 11, lines 11-13).

Claim 25: Pei teaches that the substrate may be glass (col. 12, lines 27-30).

Claim 26: Samworth teaches the convex portions can have a plurality of indentations.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pei '043 in view of Wright '081, Ozawa '837, Miyashita '271, and Samworth '018 as applied to claim 9 above, and further in view of Yamazaki et al. (U.S. Patent No. 6,274,887).

Pei, Wright, Ozawa, Miyashita, and Samworth are discussed above, but do not explicitly teach that the substrate includes red, green, and blue pixels. However, Yamazaki teaches that it was extremely well known in the EL art to have formed red, green, and blue pixels on a substrate (col. 32, lines 40-43). Because Yamazaki teaches that such EL configurations were operable in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed red, green, and blue pixels on the EL substrate of Pei and the have formed each pixel using the flexographic method with a reasonable expectation of success.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pei '043 in view of Wright '081, Ozawa '837, Miyashita '271, and Samworth '018 as applied to claim 18 above, and further in view of Mourrellone (U.S. Patent 4,542,693, hereafter '693).

Pei, Wright, Ozawa, Miyashita, and Samworth are discussed above. Wright teaches that the amount of ink on the supply roller may be controlled, but the references do not explicitly teach causing the EL material to have a uniform thickness on the supply roller.

Mourrellone teaches for a device comprising a letterpress (col. 1, lines 1-16) ink cylinder (T) and supply roller (A) that the provision of an equalizing roller (9) that provides an ink layer of uniform thickness on supply roller (A) (claim 8) advantageously improves the regularity of ink application and avoids the formation of undesired stripes (col. 7, lines 10-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have caused the EL ink of Pei to have had a uniform thickness on the supply roller by using the equalizing roller of Mourrellone because Mourrellone teaches that such an equalizing roller would have improved the regularity of the ink application and avoided the formation of undesired stripes.

10. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pei '043 in view of Wright '081, Ozawa '837, Miyashita '271, and Samworth '018 as applied to claim 9 above, and further in view of Nagayama et al. (U.S. Patent No. 5,701,055, hereafter '055).

Pei, Wright, Ozawa, Miyashita, and Samworth are discussed above, but do not explicitly teach that the barrier ribs are in the form of a stripe (claim 20) or a matrix (claim 21). However, Nagayama teaches that barrier ribs in an EL device can be either a stripe shape or a matrix shape (Figs. 1-2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed the barrier ribs of Miyashita in either a stripe shape or a matrix shape with a reasonable expectation of success because Nagayama teaches that either shapes are operable in an EL device. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945).

11. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pei '043 in view of Wright '081, Ozawa '837, Miyashita '271, and Samworth '018 as applied to claim 9 above, and further in view of Watanabe et al. (U.S. Patent 5,270,846, hereafter '846).

Pei, Wright, Ozawa, Miyashita, and Samworth are discussed above. Wright teaches that flexographic inks assume level surfaces (col. 1, lines 23-26), but does not explicitly teach that the ink levels after printing. However, Watanabe also teaches that inks printed from rollers may also be leveled after printing (col. 12, lines 28-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have leveled the surface on the ink after printing in order to have achieved the desired thickness.

Claim 24: Pei teaches that the layers are heated after printing (col. 11, lines 11-15).

12. Claims 9-10, 12, 14, 16, 18-25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (U.S. Patent No. 6,940,223) in view of Ozawa '837 and Samworth '018.

Yamazaki discloses a method of making an EL display (abstract). Barrier ribs 368 can be formed on a substrate (Fig. 5B), wherein the barrier ribs can be formed on polyimide (col. 15,

lines 10-14). Pixel electrodes are formed between the barrier ribs (Fig. 5B). A molding plate 114 is disposed on a molding roller 113, wherein the molding plate contains a plurality of convex and concave portions. EL material is applied to the convex lands 114b of the molding plate and then printed onto the pixel electrodes by rotating the molding roller. The convex lands have a stripe shape (Figs. 1A-1C).

Yamazaki teaches that the printing is done with a letterpress, but does not explicitly teach that the convex printing portions have a plurality of indentations. However, Samworth teaches that it was well known in the art of flexographic printing (i.e., a rotary letterpress process) to have provided a plurality of indentations on the convex lands (col. 5, lines 1-5; Fig. 2). Because Samworth teaches that such structures of the convex printing portions were operable for flexographic plates, it would have been obvious to one of ordinary skill in the art at the time of invention to have provided the convex printing portions of Yamazaki with a plurality of indentations with a reasonable expectation of success.

Yamazaki does not explicitly teach that the pixel electrodes are formed after forming the barrier ribs on the substrate. Because of the barrier ribs overlap the electrodes, the barrier ribs must be formed first. However, Ozawa teaches that it is well known in the art of EL devices to use barrier ribs (i.e., banks) between pixels of different colors. A pixel electrode 41 can be formed between the barrier ribs and comes into contact with the upper portion of the barrier ribs (Fig. 6(B)). Ozawa teaches that such configurations were operable but would partially produce a light that does not contribute to the displaying of an image, thus resulting in a useless driving current (col. 11, lines 33-47). One of ordinary skill in the art would have used the structure of Fig. 6(B) with the knowledge that extra driving current would be necessary because Ozawa teaches that such structures were operable. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed the barrier ribs of Yamazaki without overlapping the pixel electrodes with a reasonable expectation of success. The barrier ribs would have necessarily prevented the spread of the EL material.

Ozawa does not explicitly teach that the pixel electrodes are formed after forming the barrier ribs. However, one of ordinary skill in the art would have expected the formation of either layer first to have achieved similar results and would have used one method over the other with predictable results. The selection of any order of performing process steps is *prima facie*

obvious in the absence of new or unexpected results. See, for instance, *In re Burhans,* 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed the pixel electrodes prior to forming the barrier ribs with a reasonable expectation of success.

Claim 10: Yamazaki teaches that the substrate includes red, green, and blue pixel patterns (col. 18, lines 25-26).

Claim 12: Yamazaki teaches that the barrier ribs defines boudaries between pixels (Fig. 5B).

Claim 14: Ozawa teaches that the barrier ribs has a height larger than the combined thickness of the EL layer 40 and the pixel electrode 41 (Fig. 6(B)).

Claim 16: Yamazaki teaches that the barrier rib can be made of polyimide (col. 15, lines 10-14).

Claim 18: Yamazaki teaches that a supply roller 110 is coated with the EL material and that the supply roller and molding roller 113 are rotated so that the land on each of the convex portions contacts the EL material on the supply roller (Fig. 1A).

Claim 19: Ozawa teaches that the EL layer has substantially uniform thickness (Fig. 5B).

Claims 20-21: Ozawa teaches that the barrier ribs are formed in a stripe and a lattice shape (Fig. 6(B)).

Claim 22: Ozawa does not explicitly teach that the EL material covers the lands to a thickness of less than 1000 Å. However, Ozawa does teach that the EL layer can have a thickness of 10 to 400 nm (i.e., 100 to 4000 Å) (col. 15, lines 56-58). The thickness of the EL material on the lands would correspond to the thickness of the EL layer on the substrate and would necessarily have an overlapping range with the claimed range because at least a 100 Å layer thickness would require less than 1000 Å thickness on the lands.

Claim 23: Ozawa teaches that the EL material has an even surface after being printed onto the substrate (Fig. 5B).

Claim 24: Ozawa teaches that the EL material is heated to vaporize the solvent contained in the EL forming material (col. 4, lines 22-26).

Claim 25: Ozawa teaches that the substrate can be made of glass (col. 8, lines 41-44).

Response to Arguments

13. Applicant's arguments, see pg. 6, filed 4/28/2008, with respect to claims 9-10, 12-16, and 18-26 have been fully considered and are persuasive. The 35 U.S.C. 112, first paragraph rejection of the claims has been withdrawn.

14. Applicant's arguments filed 4/28/2008 have been fully considered but they are not persuasive.

Claims rejected under 35 U.S.C. 103(a):

Applicant argues on pg. 7 that Miyashita fails to teach the material of the barrier rib is selected from the group consisting of polyimide and an acryl-group organic compound described in claims 9 and 27. However, the claims merely require the barriers ribs to be made from either polyimide *or* an acryl-group organic compound. Miyashita explicitly teaches that the barrier rib can be made of a photosensitive polyimide material. Although Miyashita does not use the term "consisting of", Miyashita does seem to suggest that only polyimide can be used as the material for the barrier rib.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bayer, Jr. (U.S. Patent No. 5,597,618) and Pappas et al. (U.S. Patent No. 5,162,119) are cited for their teachings regarding the relative orientation of substrates and printer rollers. Maracas et al. (U.S. Patent No. 6,013,446) teaches indentations on the convex portions of a stamp can increase the absorbency of the stamp (col. 5, lines 51-61; Fig. 11).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jimmy Lin/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792